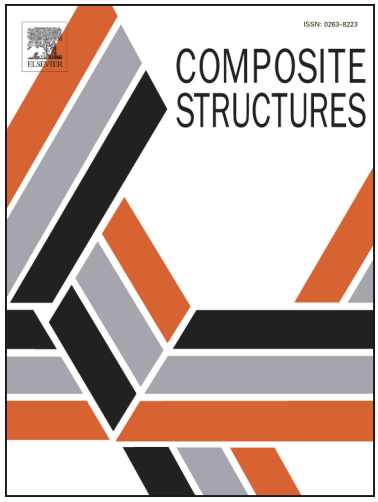

Micromechanical and dynamic mechanical analyses for characterizing improved interfacial strength of maleic anhydride compatibilized basalt fiber/polypropylene composites

Seongyeol Pak, Sunmin Park, Young Seok Song, Doojin Lee

PII: S0263-8223(18)30435-5
DOI: https://doi.org/10.1016/j.compstruct.2018.03.020
Reference: COST 9467

To appear in: *Composite Structures*

Please cite this article as: Pak, S., Park, S., Song, Y.S., Lee, D., Micromechanical and dynamic mechanical analyses for characterizing improved interfacial strength of maleic anhydride compatibilized basalt fiber/polypropylene composites, *Composite Structures* (2018), doi: https://doi.org/10.1016/j.compstruct.2018.03.020

Micromechanical and dynamic mechanical analyses for characterizing improved interfacial strength of maleic anhydride compatibilized basalt fiber/polypropylene composites

Seongyeol Pak[1], Sunmin Park[2], Young Seok Song[3,*], Doojin Lee[2,*]

Abstract

For fiber reinforced polymer composites, it is important to obtain a good interfacial bonding between the fibers and the polymer matrix to enhance the physical properties of the composites. In particular, the mechanical and thermal properties of the composites differ depending on the interfacial bonding strength, lengths, and orientations of the fibers. We investigate the microstructural anisotropy of the basalt fiber reinforced polypropylene composites and evaluate their mechanical properties, such as elastic modulus and ultimate tensile strength in order to understand the relationship between the local anisotropy and mechanical strength of the composites. Dynamic mechanical and thermal analyses are performed to characterize the grafting effect of maleic anhydride polypropylene on the basalt fibers. The grafting effect enhances the bonding strength between the basalt fibers and matrix and the thermomechanical properties of the composites. The elastic modulus and ultimate tensile strength of the composites with the grafting effect show enhancement compared to the composites without the grafting effect. The predictions of the elastic modulus by the Mori-Tanaka model

Email addresses: ysong@dankook.ac.kr (Young Seok Song), doojin@kicet.re.kr (Doojin Lee)

[1]Department of Materials Science and Engineering, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul, 08826, Korea

[2]Ceramic Fiber and Composite Materials Center, Korea Institute of Ceramic Engineering and Technology, 101 Soho-ro, Jinju-si, Gyeongsangnam-do, 52851, Korea

[3]Department of Fiber System Engineering, Dankook University, 152 Jukjeon-ro, Suji-gu, Gyeonggi-do, 16890, Korea